

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington D.C. 20554**

In the matter of:)	
)	
Unlicensed Operation in the TV)	ET Docket No. 04-186
Broadcast Bands)	
)	
Additional Spectrum for Unlicensed Devices)	ET Docket No. 02-380
Below 900 MHz and in the 3 GHz Band)	
)	

COMMENTS OF

National Systems Contractors Association

The National Systems Contractors Association or NSCA, was founded in 1980 to be the voice and advocate for the commercial electronics systems industry. NSCA represents over 2,500 member companies who manufacture, design, install and support a wide variety of audio, video, data communications, security and other technologies in markets such as schools, churches, hospitals, and government facilities. In addition, NSCA offers a wide spectrum of professional development programs including on-line training, certifications, and continuing education for thousands of systems professionals. NSCA works year-round to promote the growth and prosperity of the electronics systems industry.

NSCA is directed by veteran industry executive Charles R. Wilson, and is based at 625 First Street SE, Suite 420, Cedar Rapids, IA 52401. The NSCA Board of Directors is comprised of twelve electronic systems professionals who operate independent businesses throughout the U.S.

Specific to this concern, NSCA's membership includes six of the leading manufacturers of wireless microphones and other wireless audio systems that collectively represent

approximately 85% of the U.S. market for wireless microphones, based on a recent study. These companies are AKG Acoustics of Nashville, TN; Audio-Technica U.S. of Stow, Ohio; Sennheiser Electronic of Old Lyme, CT; Shure Incorporated of Niles, IL; Sony Electronics of Park Ridge, NJ; and Telex Communications of Burnsville, MN.

The wireless microphone members of NSCA share concerns over the consequences that could result if recommendations in FCC ET Docket No. 04-186 are implemented without providing adequate protection for wireless microphones and other wireless audio systems. These devices operate in vacant television channels as licensed secondary uses under Part 74 of the FCC Rules. In this Notice of Proposed Rule Making (NPRM)¹, the FCC has recognized the presence of wireless microphones in the TV spectrum.

However, none of the remedies proposed by the Commission appears to provide adequate protection for wireless microphones from interference that would result from the operation of new unlicensed services in the band. Accordingly, NSCA members urge the Commission not to rush to adopt new rules, but to work closely with the wireless microphone industry and the various proponents of new unlicensed devices to develop safeguards that will ensure that wireless microphones can continue to operate without interference. It is essential that these safeguards be codified into the FCC Rules in order to be effective.

I. Wireless Microphones provide an important service to the public

In this Docket, the FCC has proposed allowing new unlicensed devices to operate in the “white spaces”, or unused television channels that generally exist in most cities. However, these “vacant” TV channels are already being actively used by wireless microphones, and also by other wireless audio devices, such as in ear monitors and

wireless intercoms. Wireless microphones are now a critical part of virtually every large public event, to the extent that most productions would be impossible without their availability. In addition, it is mandatory that these devices operate reliably and without interference. If a problem occurs during a live telecast, it will be observed by millions of viewers simultaneously. On the other hand, to the extent that effective methods for preventing interference to wireless microphones from unlicensed devices can be found, opportunities may exist for sharing the TV spectrum with other users.

II. The interference prevention remedies proposed by the Commission do not address the needs of Wireless Microphone users

In this NPRM², the FCC has suggested several ways of preventing interference to incumbent licensed users of the television broadcast spectrum. Prominent among these is the idea of requiring unlicensed devices to listen for a control signal to determine what TV channels they could use at a particular location. The NPRM suggests that the control signal could be transmitted by a radio or TV station, or by another unlicensed device. Although this approach might work for protecting TV stations from interference, it does not appear that it would be suitable for protecting wireless microphones without a convenient way for users to enter their frequency information into the database. In addition, the database would need to be updated almost continuously, because of the fact that wireless microphones are mobile and their transmissions are not scheduled like those of a television station. Another concern is the fact that the control signal would need to be able to regulate frequency use down to a very small zone within a city in order to make the best use of available spectrum for all users.

Perhaps anticipating these issues, in the NPRM the Commission suggested that for technical reasons, perhaps wireless microphones could operate satisfactorily without

¹ ET Docket No. 04-186; "Unlicensed Operation in the TV Broadcast Bands"

² ET Docket No. 04-186; "Unlicensed Operation in the TV Broadcast Bands"

any specific protection from interference.³ In the analysis given, the Commission assumed that wireless microphones transmit the maximum allowed power of 50 mW ERP in VHF frequencies, and 250 mW ERP in UHF frequencies. It also suggested that the short distances at which wireless microphones are used and the operation of the FM “capture effect” would make interference unlikely. Unfortunately, these conditions are usually not met in actual practice. Few wireless microphones operate with the maximum power allowed. In addition, wireless microphones are mobile, and in the indoor environments in which they are often used, their signals are subject to fading and multipath. As a result, the signal at the wireless microphone receiver will not always be strong enough to be able to overcome interference from an unlicensed device operating nearby in the same TV channel. Finally, there is no practical way to guarantee that an unlicensed device would not be used in the same location as a wireless microphone system; perhaps at very close range. Therefore, it is apparent that a more reliable means of preventing interference is needed.

III. The Commission should exempt several TV channels in each market from unlicensed device operation

One approach suggested by the Commission in this Docket is the possibility of making available several “exempt” TV channels in each market that would not be used by unlicensed devices. Because of the fact that wireless microphone systems are designed for either VHF or UHF operation (not both), exempt channels would be required in both bands. These channels could provide a “safe harbor” for wireless microphones and other secondary users of the TV spectrum where they could operate without interference. This idea has merit for several reasons. First, it would be relatively easy to implement. The “exempt” TV channels could be “advertised” to unlicensed devices by means of the same control signal technology that is used to advertise those

³ See ET Docket 04-186; Section E; “Wireless Microphone Operations”

TV channels that must be avoided because they are in use by local TV broadcasting stations. This would enable the Commission to revise the exempt channel assignments when necessary due to TV channel reallocations. Importantly, the availability of exempt TV channels would provide at least some spectrum where wireless microphone users could operate their equipment without interference from unlicensed devices. The main limitation of this method is the small number of exempt channels that are likely to be appropriated.

IV. A dynamic frequency reservation scheme is needed in addition to the “exempt” channels

For large installations such as the Super Bowl or a national political convention, “exempt” TV channels will cover part of the requirements, but not all. Events such as these may require upwards of 200 wireless audio channels. For such situations, a dynamic frequency reservation scheme that exercises control over unlicensed device TV channel selection within a limited radius of operation would be the best method for ensuring that adequate spectrum is available for wireless microphones when and where it is needed. This would allow wireless microphone users to dynamically “request” the use of frequencies when they are needed, and release them for other purposes when they are not. Thus this concept offers a spectrally efficient solution.

V. Economic impact on current users of wireless microphone systems

Many of the current users of wireless microphone systems are small churches throughout the US. These groups, as well as educational institutions that extensively rely on wireless microphones, will be very adversely impacted by proposed changes. Already, these groups with limited financial resources are being forced to replace wireless microphone systems due to the startup of digital TV stations on the same frequencies.

The exact number of systems currently in use that will be impacted cannot be accurately calculated, but they number in the thousands. Many of the groups using these systems can ill afford to replace wireless microphone systems costing from \$500-\$1,000 that are working properly, but which will suddenly be on frequencies occupied by other wireless users. NSCA member companies already report hundreds of small churches and schools whose wireless microphone systems have become unusable due activation of digital TV stations on the fixed frequencies these systems use. The economic impact on existing wireless microphone users will only become worse if all frequencies are open to allocation.

CONCLUSIONS

Wireless microphones are vitally important to the production of many public events, and it is therefore in the public interest to protect their operation from interference. Although the National Systems Contractors Association (NSCA) shares the Commission's desire to increase the amount of spectrum available for unlicensed use by the public, this must be done in such a way that existing users are not disadvantaged. If new unlicensed devices are permitted to operate in the television broadcast spectrum, the Commission must be careful to ensure that these devices do not interfere with wireless microphones and other types of wireless audio equipment.

NSCA supports the Commission's proposal to establish several "exempt" TV channels in each market in which wireless microphones would be able to operate without interference from unlicensed devices. In addition, NSCA requests the FCC to carefully consider technical solutions that could address the needs of large wireless installations.

Respectfully submitted,

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